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THE PROGRESS OF DEATH

IN SCOTLAND AND HER COUNTIES

SINCE 1855 :

A COMPARISON.

Presidential Address

*Delivered at the Annual Congress of the Sanitary Association
of Scotland, 1891.*

BY

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February 9th 1892.

Dear William Thomson D.C.L. &c. &c.
President Royal Society

Dear Sir,

I have much pleasure
in enclosing you a copy of
a paper I prepared for
the Congress of the Sanitary
Association of Scotland.

Dealing as it does with Scot-
land I have hope it may
be of some interest to you.

I have the honor to a

Dear
yours very faithfully

Peter Fyfe.

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IN

SCOTLAND AND HER COUNTIES SINCE 1855 :

A COMPARISON.

—o—

SINCE you did me the honour to elect me President of this Association, I have been somewhat anxiously meditating upon an address which might be instructive and at the same time run on paths comparatively untrodden.

In these days of general enlightenment and voluminous publication, the observant mind soon becomes impressed with the salient features of any applied science. The science of sanitation is not excepted from this rule. It is young in years, but in the heart of the nation it is growing mature and strong. Men and women in this kingdom are now coming to understand and believe that, "in order to the prevention of filth diseases, the prevention of filth is indispensable ;" and not only so, but also to appreciate, to some extent, Sir John Simon's other truism, that "the exacter studies of modern times have further shown that, by various channels of indirect and clandestine influence, filth can operate more subtly and also far more widely and more distinctively than our forefathers conjectured."

Two hundred years ago some of the fashionable and aristocratic celebrities of London stepped into their palaces, round the thresholds of which heaps of cabbage stalks and rotten apples

had accumulated, and Macaulay tells us that at that period St. James' Square was a receptacle for all the offal and cinders, for all the dead cats and dead dogs of Westminster. The corollary of this state of matters was a death-rate of 1 in every 23 persons per annum, or 43 per 1,000.

It is consequently obvious that such distant forefathers as these had "conjectured" little regarding filth *versus* health. To-day we are in many aspects of public health far past the conjectural period. We have arrived after great labour in the haven of certainty, and throughout the land, in the minds of even the ignorant and formerly unsympathetic, is arising a partial revolt against preventable disease and its causes. To us is given the proud position of leaders in the revolt. To make effective a further onslaught on the known enemies of health and life, we must carry extended convictions to the great body of the public, and I am firmly persuaded the London *Times* was on the right lines in its editorial of 11th August on the Congress of Hygiene and Demography, lately held in London, when it said—"The most pressing work of sanitary reformers is not now so much to legislate as to educate."

In thus expressing myself, I do not wish it to be inferred that I am satisfied with our Public Health Act of Scotland.

Before I conclude, I think I will be able to show that death from one dreadful preventable malady practically remains unchecked in our land. I refer to tubercular disease. The graves filled by tuberculosis are year by year far too many, and it will be one of the foremost aims of my address to-day to show with certainty how we stand statistically as a country in relation to this scourge. I thought it would be new and instructive also to demonstrate the general progress of health in Scotland, and the particular decrease and increase of death in her thirty-three counties since registration in 1855 to 1888—first, from all causes; second, from zymotic disease; and third, from tubercular disease. I trust I am not in error in believing that the pictures of death thus delineated will serve a threefold purpose, namely—(1) To excite the interest and attention of our legislators and our central authorities; (2) to produce a healthy stimulus to sanitary activity in our county and burghal Local Authorities; and (3)

to exhibit to the people at large in a simple, graphic, and incontestable manner, the past triumphs of sanitation over disease in some localities, and otherwise the triumphs of disease where and when probably few or no attempts have been made sanitarily to check its progress.

Before entering upon these demonstrations, it is due to explain to this Congress, as briefly as I can, the methods adopted and the basis upon which my thesis rests.

First of all, permit me to state my thesis. It is, that while Scotland as a country has advanced during the past 33 years in public health, and the death-rate from zymotic disease has all over been greatly reduced, tubercular disease has not made a corresponding advance, and in a considerable number of localities has in this period been stationary or increasing; and further, as tubercular disease is now known to be largely preventable, and has been proved to be communicable from man to man and from animals to man, the time has come when it is desirable and necessary, in the interests of the people, to have such special legal powers from Government as shall, when applied, materially reduce the death-rate from this class of disease.

To prove the first of my premises I had recourse to the Scottish Registrar's yearly returns. From these 33 statistical haystacks we have the directing lines of mortality, which you see pointing upwards and downwards in the diagrams before you.* The single diagrams at the top represent in a striking and lucid way the successes of our "last enemy" among the people of Scotland and in each of our counties from year to year since 1855. The deaths represented here are from all causes in each 10,000 persons living. Immediately beneath this "all causes" diagram you will observe two interwoven diagrams—one drawn in full black line, the other in dotted line. These represent the number of deaths in Scotland and in each separate county which occurred yearly since 1855, (1) from zymotic disease and (2) from tubercular disease out of each 100 deaths from all causes.

* See diagrams accompanying this paper. In the diagrams showing Death-rates from All Causes per 10,000, the rates range from 100 at the bottom to 310 at the top. In the Zymotic and Tubercular diagrams, the percentages range from 0 to 40.

The upper diagram, accordingly, exhibits the *general* progress or retrogression of the people in healthfulness; the lower ones, the progressive incidence upon the general death-rate of the two classes of disease which are most destructive, and which are more directly amenable to sanitary influences.

In connection with the lower diagrams, let me here explain what I have put down as zymotic, and what as tubercular disease. The Registrar-General of Scotland has twice changed the list of diseases called “zymotics” since 1855—viz., in 1877, when Dr. Farr’s nomenclature was used for the first time; and in 1883, when the “classes” and “orders” of disease were enlarged and again rearranged. Six “orders” of disease appeared this year in the class “zymotic” instead of four; while to the “constitutional” class four sub-orders were added, two of them—viz., rheumatic fever and purpura being taken from the zymotic class. All this rearrangement was doubtless scientifically necessary, but is to the statistician, among such a plethora of figures, a source of perplexity and trouble. The prevailing custom in calculating death-rates from zymotic diseases is to take what are called the seven principal orders. These are—small-pox, measles, scarlet fever, typhus, diphtheria, enteric fever, and hooping-cough. To make these zymotic diagrams as comprehensive as possible, I have added to this list chicken-pox, relapsing fever, simple and ill-defined fever, simple cholera, diarrhœa, dysentery, erysipelas, and croup. The last mentioned disease is added for two reasons—first, and mainly, because up to 1877 it is hopelessly entangled with diphtheria in the Registrar-General’s reports; and secondly, it has been thought by many experts to be the same disease as diphtheria, especially in its membranous form, and a predisposition to it appears to be caused by imperfectly drained dwellings, sewer emanations, and low lying sites.

Tubercular disease, the rates for which are shown by the dotted line diagrams, includes all deaths through phthisis, tabes mesenterica, tubercular meningitis, and scrofula. These four main so-called constitutional diseases are taken by the Registrar-General up to the latest date to represent the sum total of devastation wrought by the tubercular virus. The line of death representing the yearly incidence of this dreadful disease on the

various populations in the counties of Scotland, high as it may appear in the diagrams, is, I am convinced, below the real level. This is not the fault of the Registrar-General or his various assistants throughout the country. It is well known that the word *consumption* is a terror in families, and the popular belief that it is in itself the legacy of heredity interferes with many medical men, and has a tendency to hinder them from telling under their certificates the whole truth. This is especially the case when ladies of marriageable age happen to be among the bereaved. Surely some method could be devised (and it certainly ought to be) whereby the medical attendant may be legally required to write upon his certificate the true cause of death, and hand it, or send it *direct*, to the local registrars without submitting it to the scrutiny of relatives. In the minds of true sanitarians and vital statisticians, any system which tends to bring influences to bear against a statement of the real facts stands condemned. If secrecy be necessary and expedient, by all means let us provide for secrecy, but not at the expense of truth.

Having said so much, let me now draw your attention to the diagrams and the table of septennial death-rates. It is far from my intention to weary you with any detailed review of these diagrams. Each of them will, I think, repay quiet and thoughtful study, and it is my hope that if they are placed before you in a reduced and compact form, you will not find it waste of time to bestow this upon them. The essential part for us at the present time is what they prove, and to a statement of this I address myself.

From the initiation of the Registration Act for Scotland in 1855 down to the year 1862, our country may be said to have existed, sanitarily speaking, in the most nebulous condition. Our legislators were just awaking about this time to the fact that the apparently deeply rooted philosophy, to the effect that each death was to a very small circle calamitous and distressing, but to the social fabric of the State was more or less advantageous as it removed a consumer of the common stock, was a vast mistake. It was beginning to dawn upon them that every death under the non-productive age period was a total loss to the community at

large. The cholera epidemic had in 1848-49 devastated Scotland and filled all classes with intense alarm, and the State Board of Health were urging Scottish centres of population to bestir themselves to greater cleanliness. Yet it was not until 1862 that Scotland obtained anything approaching sanitary powers, and these were meagre at the best. Accordingly, I have taken the seven years wherein we had the benefits of registration previous to 1862—namely, 1855 to 1861, both inclusive—and exhibit upon a table—first, the average death-rate from all causes per annum per 10,000 inhabitants in Scotland, and each of her counties for these seven years ; second, the average percentage of these deaths attributable to the zymotic diseases I have already named ; third, the average percentage of these deaths attributable to tubercular disease.

These appear in three columns on the left hand side of the table, and together they may be termed the statistical sanitary picture of “Earliest Scotland,” as previous to 1855 we can get no authentic vital statistics anent our country. It will be observed that the various counties are arranged according to the lowness of their respective death-rates from all causes. Against these figures are given upon the right hand identical equivalents for the last septennial—viz., 1882 to 1888. The figures down the centre show the changes which have been made as between the various counties, in the order of their least mortality from all causes.

During the twenty-one years which elapse between these two septennial periods, it might reasonably be imagined that in every part of Scotland a steady advance in life-saving among the people had been going on, as for a long time previous to 1882 we had legal instruments at command wherewith to elevate the public health to a certain degree of excellence, if the various responsible burghal and parochial authorities had done their duty.

The table now before you holds up the mirror to the duty which has been done. The difference in Scotland between the all causes death-rates of the first septennial and the same rate in the second is 14·43 per 10,000 of the population per annum. This means a saving of life during these last seven years to the extent of 5,561, every year calculating the population of Scotland

as at the middle year—viz., 1885, or a total saving during the whole term of the septennial of 38,927 lives.

Gentlemen, this is a portion of the reward of sanitation, but a greater reward still is shown by the first diagram, as the heaviest incidence of death upon the inhabitants of our land is there shown to have been between the years of 1864 and 1875. Even a more direct evidence of the effect of sanitary work is shown by the general decrease of mortality from zymotic diseases. During the course of the first septennial, 21·28 per cent of the total deaths were from zymotics.

In the last septennial the percentage fell to 13·16, or a decrease of 8·11 per cent. I regret I cannot give a similar account with respect to tubercular disease. Our progress against this dread enemy of life has been by comparison microscopical. 16·14 per cent of our total dead fell victims to this plague in the first septennial, and 14·48 per cent in our last, or a difference in favour of our last of only 1·66 per cent.

Having now glanced at our country as a whole, let me analyze a little, and show you where public health has improved, where it is stationary, and where matters have grown worse. Taking the death-rate from all causes first, the following counties show, in comparing the two septennial periods, an improvement of over 10 per 10,000 living—viz., Haddington, Nairn, Aberdeen, Perth, Stirling, Dumbarton, Ayr, Forfar, Edinburgh, Renfrew, and Lanark. Those that show an improvement under 10 per 10,000 are Peebles, Kincardine, Banff, Roxburgh, Fife, and Kirkcudbright. The counties which have remained stationary are Berwick, Ross and Cromarty, Sutherland, Wigton, Dumfries, and Bute.

It is now my duty to point out that ten counties have apparently gone back in health, six of them to an extent less than 10 per 10,000, and four of them over 10 per 10,000. The former lot of these “black sheep” comprise Linlithgow, Clackmannan, Kinross, Argyle, Elgin, and Orkney; the latter, Selkirk, Inverness, Caithness, and Shetland.

In fatalities from zymotic disease, the table and also the diagrams show a universal progression in the right direction. No county bears the terrible stigma of being reactionary with

regard to truly infectious maladies. While this is so, it will be observed that a few counties have been lingering on the way. I take an example. It is the pigmy county of Scotland—little Clackmannan. From 1855 to 1861 her average zymotic rate was 16·71 per cent of her total deaths. In the 1882-88 septennial it was 13·78, or 2·93 per cent of an improvement in twenty-one years. Her little twin-sister, Kinross, in the same period made an advance of 8·97 per cent, or over three times greater progress. The county which has the highest credit, from the table and diagrams illustrative of the progress of zymotic disease, is Forfarshire. No less a difference than 12·70, or nearly $12\frac{3}{4}$ per cent, is shown in the last seven years over the first seven. A very high zymotic rate was maintained in this county until 1874, after which, as if by magic, these diseases fell from their deadly eminence of 28 per cent to 16 per cent in 1875, and they have rarely done much more mischief up to 1888. Forfarshire is to be congratulated on her success in grappling with zymotics, as although she is handicapped with the third city in Scotland—"Bonnie Dundee"—and although she is only thirtieth in general healthiness, in freedom from a high zymotic rate she ranks twenty-third.

The county which in the 1882-88 septennial shows absolutely the lowest average zymotic rate is Orkney at 5·74 per cent. The lowest rate during the 1855-62 septennial was 9·57 in Sutherlandshire, so we see that progress in this direction has been made even in minimums.

Speaking generally, in similarly conditioned communities a universally low rate of mortality from infectious disease indicates a high rate of health administration. Sanitary zeal means shrinking zymotics. Liberal expenditure for health purposes by any sanitary authority may be taken as indicative of sanitary zeal. In making these statements I have my eye at present on one of our most beautiful pastoral counties, through which the Ettrick and Yarrow flow in pellucid sweetness. Selkirkshire, rich in beauty and historic associations, is, alas! also rich in zymotic death. Her position is so strange in this respect, compared with her surrounding neighbours, that I was tempted to enquire into the cause.

You will observe from the table that, while Roxburgh and Peebles have an average zymotic rate of 10·84 and 9·54, Selkirk, although eighth among the counties in her general rate, permits 13·13 per cent of her dead to succumb to this class of diseases. If she were arranged according to her zymotic rate she would fall from being the eighth in position to the twenty-sixth.

Now I find from Dr. Skelton's *Handbook on Public Health and the Local Government Act*, page 54, that Selkirk, as a county under the Public Health Act, 1867, administered by the Parochial Boards, had the following staff to carry on sanitary administration :—Medical officers, none; sanitary inspectors, 5; total amount of salaries paid to these five sanitary inspectors, £16, 10s. per annum, or at the rate of £3, 6s. each. I find also from the annual reports of the Board of Supervision from 1882 to 1888, that the total expenditure for public health purposes in all Selkirkshire during these years was £1,974. I have mentioned the zymotic rates of Roxburgh and Peebles in comparison with that of Selkirk. Let us see how they compare as to the means employed and the money expended in the cause of public health. Roxburgh, having fully double the population of Selkirk, employed in the county 9 medical officers at an expenditure of £28, 14s. per annum, and 24 sanitary inspectors at an expenditure of £95, 19s. per annum; while, in the course of the seven years 1882 to 1888, she spent no less than £44,824 in the cause of public health. Peebles, with a population almost the half of that of Selkirk, had for county purposes, 2 medical officers costing £4, 16s. per annum, and 10 sanitary inspectors at an outlay of £35, 10s. per annum; and in the seven years for public health purposes she spent £7,981, or, with half the population, £6,007 more than her populous sister. Other, and to me unknown, causes may be at work to place Selkirk in her unenviable position; but it is quite evident that what her people have gained in pocket they have more than lost in zymotic filled graves.

Other counties, such as Linlithgow, Renfrew, and Lanark, exhibit features in this respect of melancholy interest, and it behoves the burghal and county authorities within them to purge their districts of diseases, which have no right there in the proportions in which our table and diagrams find them. This

remark may be said to apply with greater force to Linlithgowshire than to the other two, in that the latter have within their borders the busy centres of compacted population, where the zymotic bacteria can slay their victims in the greatest numbers. That we should find Linlithgow, over the last seven years, permitting infectious disease to prevail to such an extent as to place her third from the worst in Scotland, is, to say the least of it, unexpected ; but, while it casts unavoidable reflections on her past authorities, it should form a strong incentive to her new authorities to spare neither money nor pains to regain for her her true position among Scottish counties. I would fain linger upon these zymotic diagrams, and show how they influence the "all causes" diagram above them, how the sharp peaks of the one are often faithfully reproduced year after year upon the other ; but I must pass on, contenting myself with calling the students' attention, especially those of Scotland, to Caithness, Elgin, Aberdeen, Forfar, Perth, Clackmannan, Dumbarton, Renfrew, Edinburgh, Peebles, and Dumfries.

We now come to consider the thirty-three districts of our country in relation to tubercle in its fourfold forms. The first thing we see in looking at the dotted line diagrams is the even lines of death-rate which they show for the most part. In scrutinizing closely, however, we find that a gradual, though very small improvement has taken place in twenty-two counties. These are Orkney, Caithness, Sutherland, Inverness, Ross and Cromarty, Kincardine, Elgin, Banff, Nairn, Argyll, Kinross, Perth, Aberdeen, Ayr, Bute, Dumbarton, Edinburgh, Renfrew, Lanark, Berwick, Roxburgh, and Wigtown. In six counties the tubercle bacillus has apparently held his own—namely, in Clackmannan, Haddington, Linlithgow, Stirling, Forfar, and Dumfries ; while in the remaining five this insidious foe has actually gained ground since the early years of the fifties. These five are Shetland, Fife, Selkirk, Peebles, and Kirkcudbright. As might naturally be expected from its situation, its dry and bracing climate, and its free loamy soil over a gravelly or sandy substratum, Nairn bears the palm along with Inverness among the counties for freedom from tubercle. During the first septennial, 13·71 per cent of the total dead in Nairn fell from tuberculosis.

In the last septennial this percentage fell to 9·51, or a difference of 4·2 per cent. For the same periods Inverness shows 11·42 and 9·47 respectively, or a fall in the last septennial of 1·95 per cent. These are the only counties which can boast of a single figure percentage in this column. Aberdeen and Bute are the only other counties which show a reduction of over 4 per cent in this rate in the 21 years.

It is with sorrow that I find our beautiful Selkirk again showing herself sanitarily ugly. She ranges in tubercular death far ahead of any other county, no less than 18·36 per cent being her average rate during the last septennial from tubercular disease. This rate of death is 2·36 *more* than she was burdened with from 1855 to 1861. Her position both in respect of zymotic and tubercular disease and death demands, in my opinion, enquiry on the part of our central authorities into her condition, and as to the causes which are at the root of such an unfortunate state of affairs.

Now, Gentlemen, what conclusion can we come to as we glance along those almost parallel dotted lines? Is it not this, that since registration began in 1855 down to the year 1888, so far as tubercular disease is concerned, sanitation, as at present supported by law, has been, comparatively speaking, a failure. The general health has improved, but proportionally tuberculosis has not been grappled with. In some counties we certainly can show that among a hundred graves, two or three less were filled by consumptives during the last than during the first septennial, but for all Scotland the national graveyard contains in the last septennial only 166 tubercular victims less per 10,000 of the departed than it did in the first. We are not satisfied to call this progress, and less so than ever since Koch in 1881 discovered and demonstrated the immediate cause of tuberculosis.

The second premise of my thesis—viz.: “that tuberculosis is communicable from man to man and from the lower animals to man,” is not, unfortunately, capable of such complete demonstration as the first. We cannot, unhappily, draw a diagram which would show conclusively that that number of men or women fell victims to the dread bacillus from breathing contaminated dust, or eating infected food, or drinking inoculated milk, nor (2)

are our scientific experts agreed among themselves upon certain points connected with the inception of this baleful disease, but now we do know that a specific bacillus does exist as the direct cause of tubercle, and most of us believe that dwelling under certain conditions, and eating and drinking food containing the spores or seeds of the tubercular germ will, in all probability, end in the consumptive's doom.

What do we mean when we say that our people are made phthisical by "dwelling under certain conditions?" We mean that this contagion, like that of several of the zymotics, is propagated, if not caused, by filth in the wrong place:—Filth in the home and its surroundings, filth on the person, filth in the air breathed, filth in the food and drink. By filth, we mean all matter, both general and specific, which tends to cause or breed disease.

Gentlemen, it sometimes appears to me cruel on the inhabitants of our land that tubercular disease, which yearly cuts off one-seventh of our dead, should be one of slow progress. If, upon its first entry into the human system, it were as keen and deadly in its course as small-pox or typhus fever, we would long ere this have been compelled to face boldly and resolutely the problem of its amelioration, if not of its extinction. But, alas! its progress is so insidious and tardy that long before it becomes in the individual diagnoseable, or ends in his demise, we have lost all trace of the circumstances attending its causation. To us who cry aloud for free and abounding ventilation of workshops, factories, schools, and dwellings, it is galling to hear the sneering reply of the unbeliever—"Where is your proof that vitiated air is the direct cause of phthisis?" We seek to enforce the thorough subsoil drainage of an inhabited locality, believing strongly in Dr. Buchanan's evidence that this appears essential to the diminution of phthisis. Again, the infidels confront us with the words, "Theoretical nonsense." The poor unfortunates, within whose withering frames the fierce malady is burning, unlike the victims of enteric, typhus, or scarlet fever, can move freely about in society, scattering broadcast on floors, beds, in our public places—nay, around our very children, the deadly sputum which has been proved to have been full of

infectivity ; here, again, we are helpless, and legislation is dumb. The flesh of the tuberculous ox, and the milk of consumptive cows are still surreptitiously vended among the people at imminent risk to health, and only a few populous centres are armed with powers specific enough to grapple with the danger.

Gentlemen, we are still "conjecturing" as to whether these things are "channels of indirect and clandestine influence," through which in one decade a fortieth of our race arrive at "that bourne from which no traveller returns." I am afraid it is the case that in this matter we are yet wondering what to do. As an engineer, I do not hold myself as competent to judge upon this momentous question, but along with many other laymen, who are reading from time to time the widely diverging views of scientists and experimentalists, I feel that, if what some of the best of them say is true, the population under our care have grave reason for demanding instant remedial legislation. It was with eager expectancy that I read the London *Times*' report of Professor Burdon Sanderson's address in opening the discussion on "Tuberculosis." When I got to the end of this discussion I was still in a state of expectancy, for although the Professor came to the conclusion, as an individual, that "the creation of a systematized meat inspection, extending not only to the great towns, but over the whole country, was desirable, and that tuberculosis should be included in the schedule of the Contagious Diseases (Animals) Act"; and although other eminent investigators admitted the risk to the public of giving them the milk and the flesh of animals affected with tubercle, I found that the motion, which was gravely put and carried as the result of all this important discussion, was in these terms—"That the etiology of tubercular disease of early infancy, between three months and five years old, be *referred for discussion at the next Congress.*"

Gentlemen, this may mean much or it may mean little, but to the ordinary intellect, applying itself as best it may to the whole bent and meaning of this debate of the savants, it is certainly "caution large," if, indeed, it is not a discreet shirking of the whole matter.

Fortunately, as I believe, our Standing Committee on Sanitary Matters in the House of Commons, of which our President of

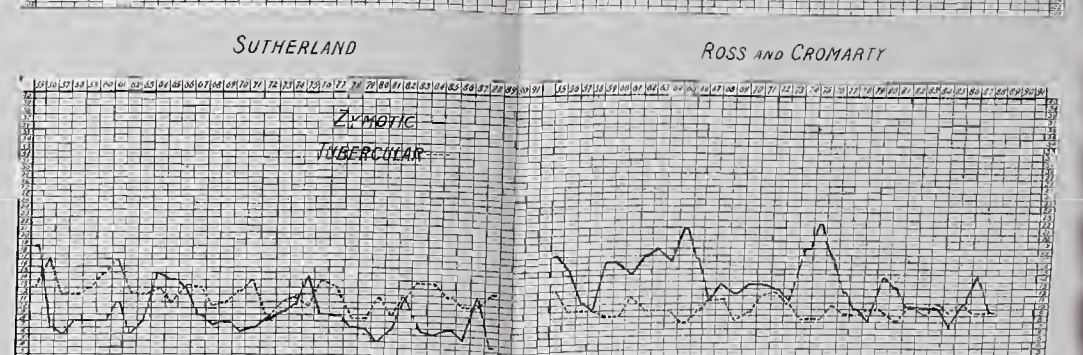
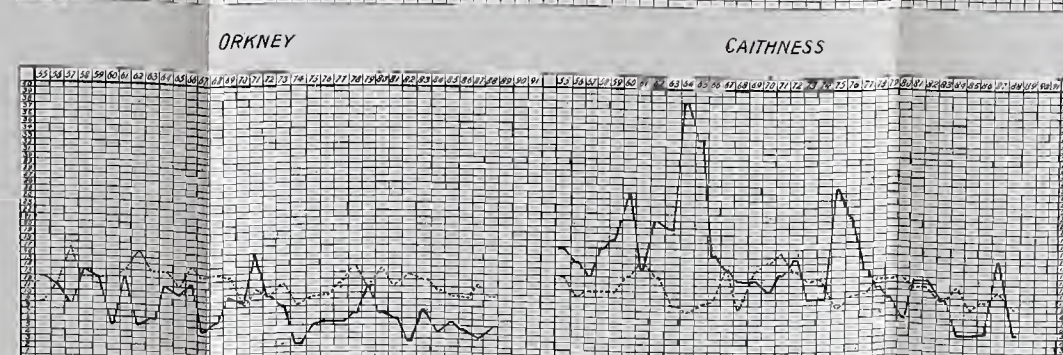
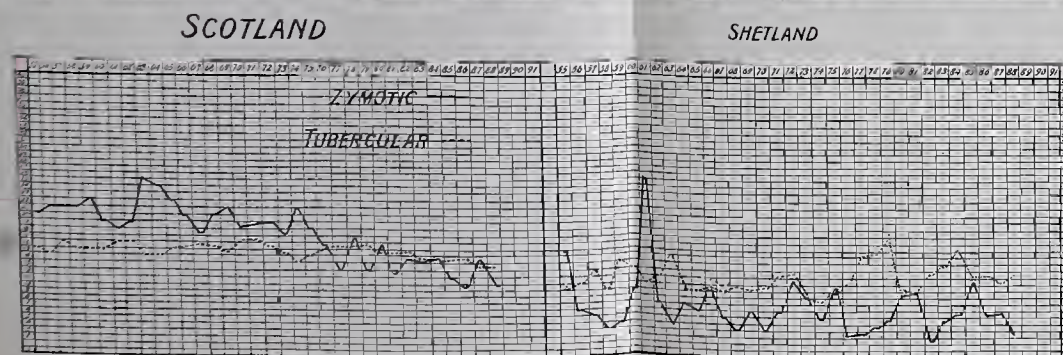
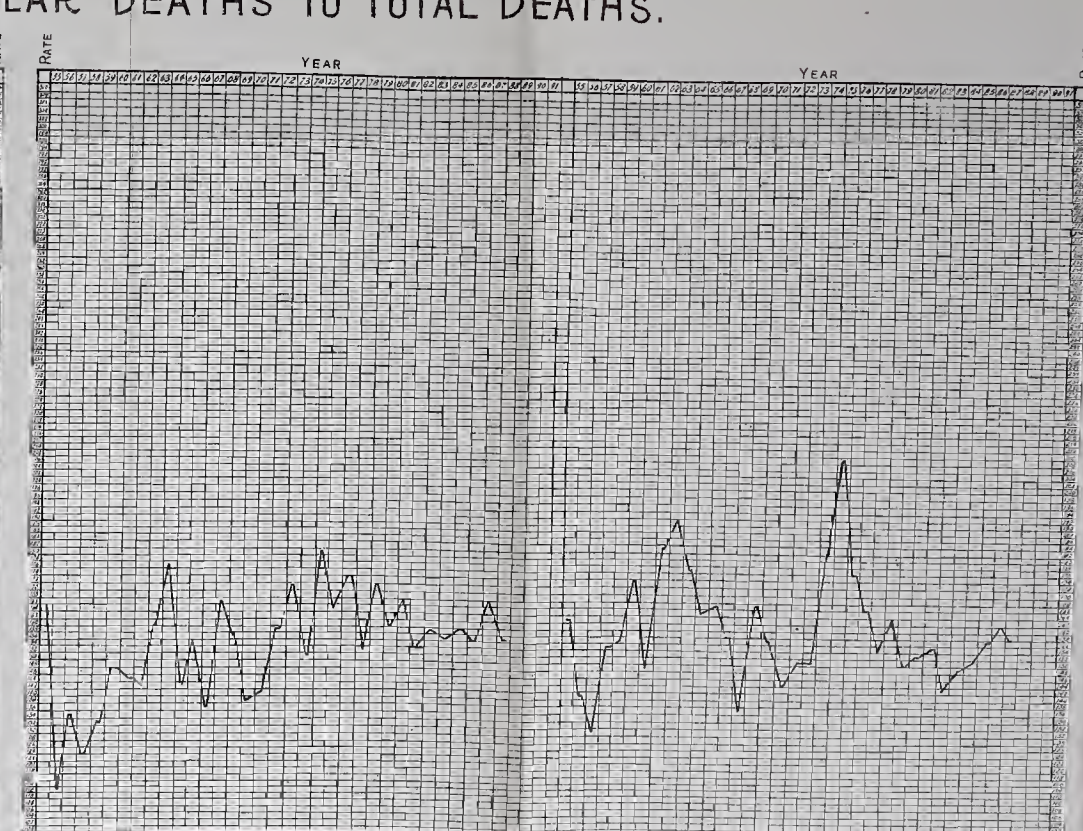
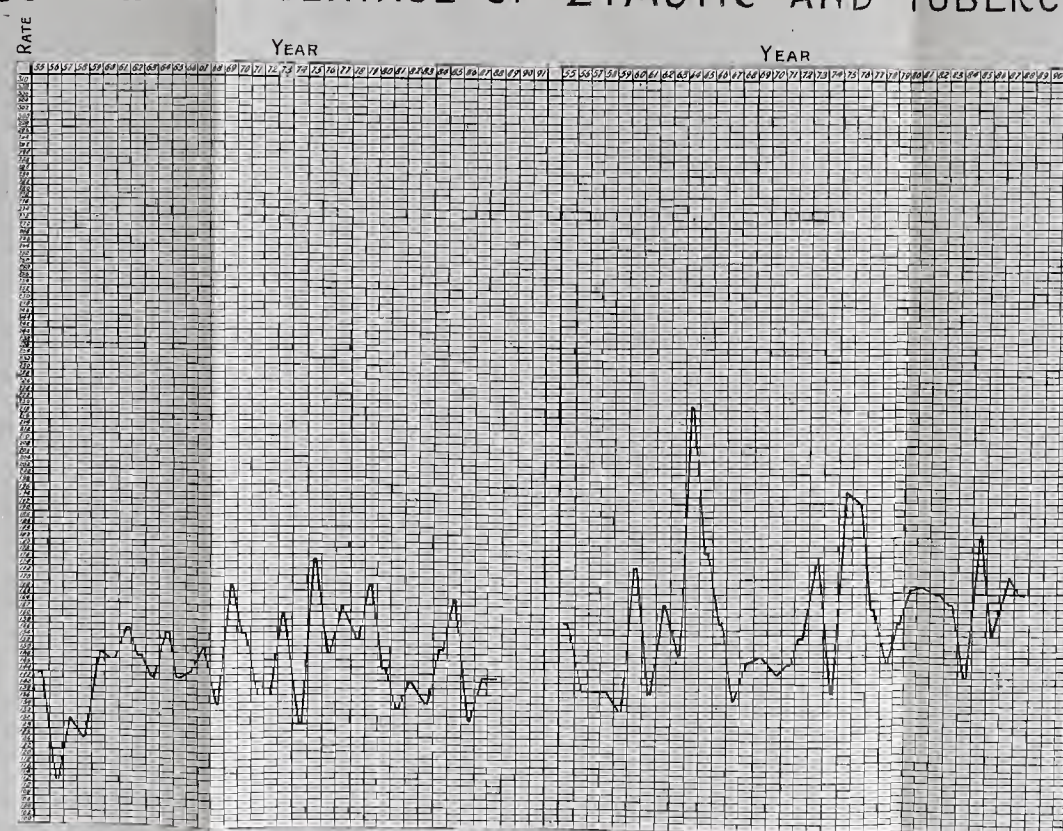
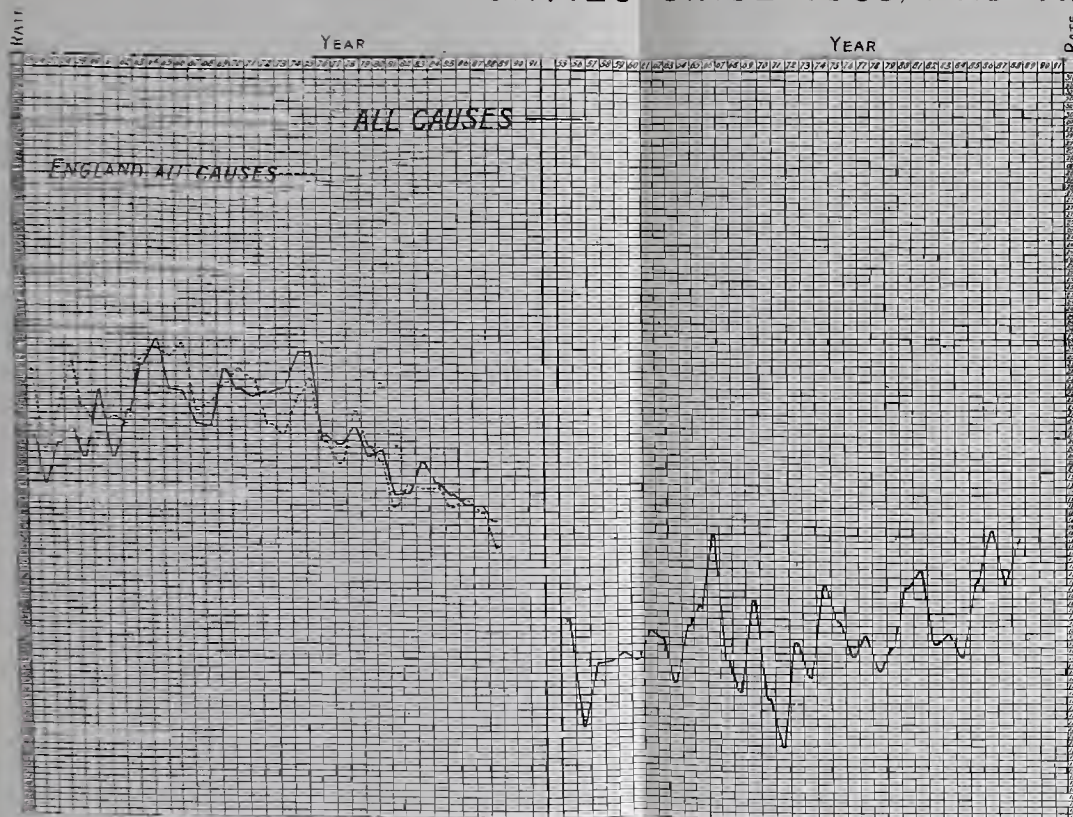
Congress, Dr. Farquharson, is a distinguished member, have the courage of their opinions, and have passed measures lately for Glasgow and Edinburgh, which enables these cities to guard their citizens in great degree from the consumption of beef and milk inoculated with the specific virus of tubercle.

Last year, before the Congress of this Association in Perth, Professor Hay attacked, in a lucid and most valuable paper, the impure air of many of our schools, and showed clearly how many of our children are in all likelihood done to death in close and ill-ventilated class-rooms. Your President of last year, Dr. Cameron, M.P., referred at the end of his able address to the smoke-laden condition of the atmosphere of our towns as the prime factor in lung disease; and again and again the foetid air in the houses of the poor has been proved to be the destroyer of youthful life, and the cause of ultimate death in those who have passed into maturer years. But as yet we have no specific law as to the quality of a town's atmosphere, and a very imperfect law as to the production of smoke. We have no law as to the quality of air which must be supplied to our school children, nor have we any power to compel adequate ventilation in humble dwellings, which may not be stopped by the injudicious application of a bundle of rags by the ignorant householder.

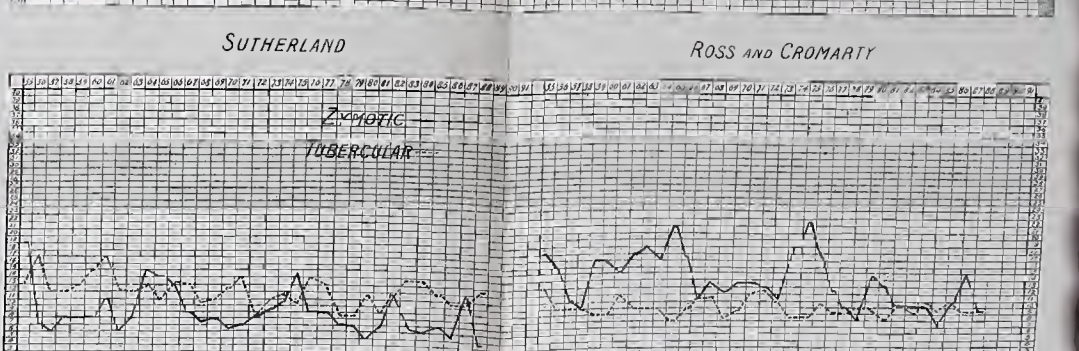
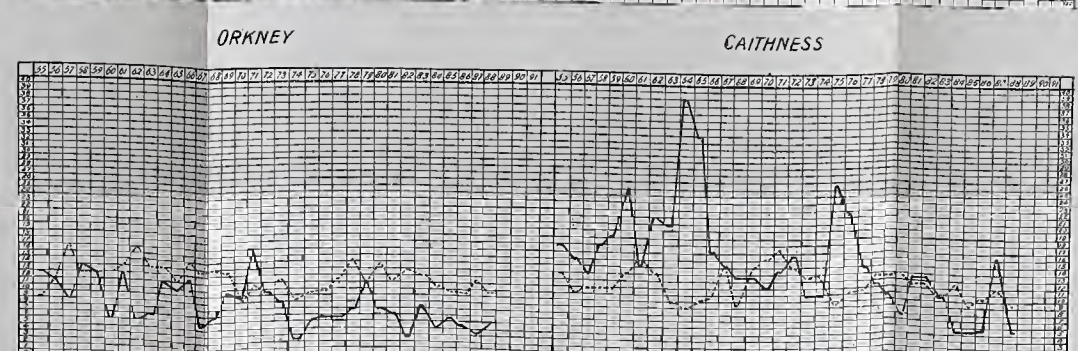
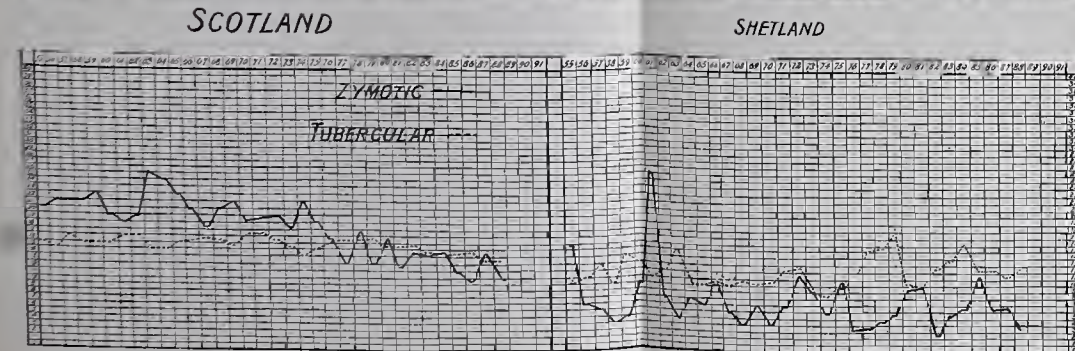
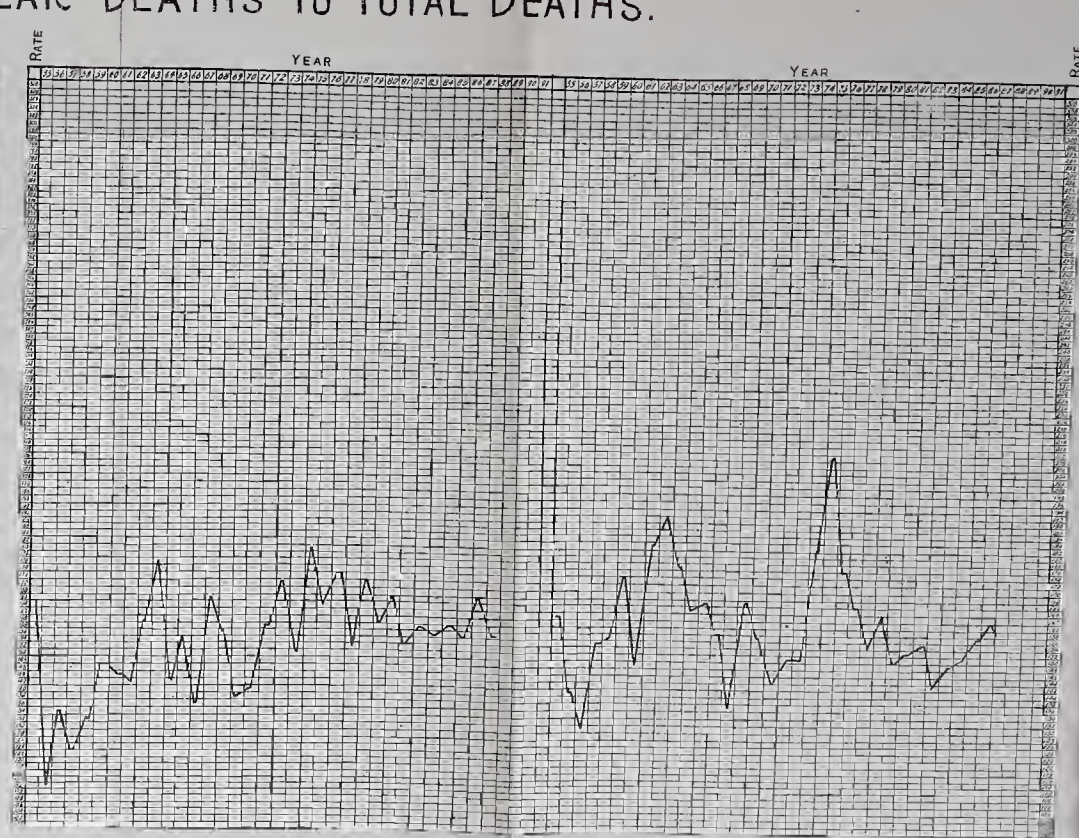
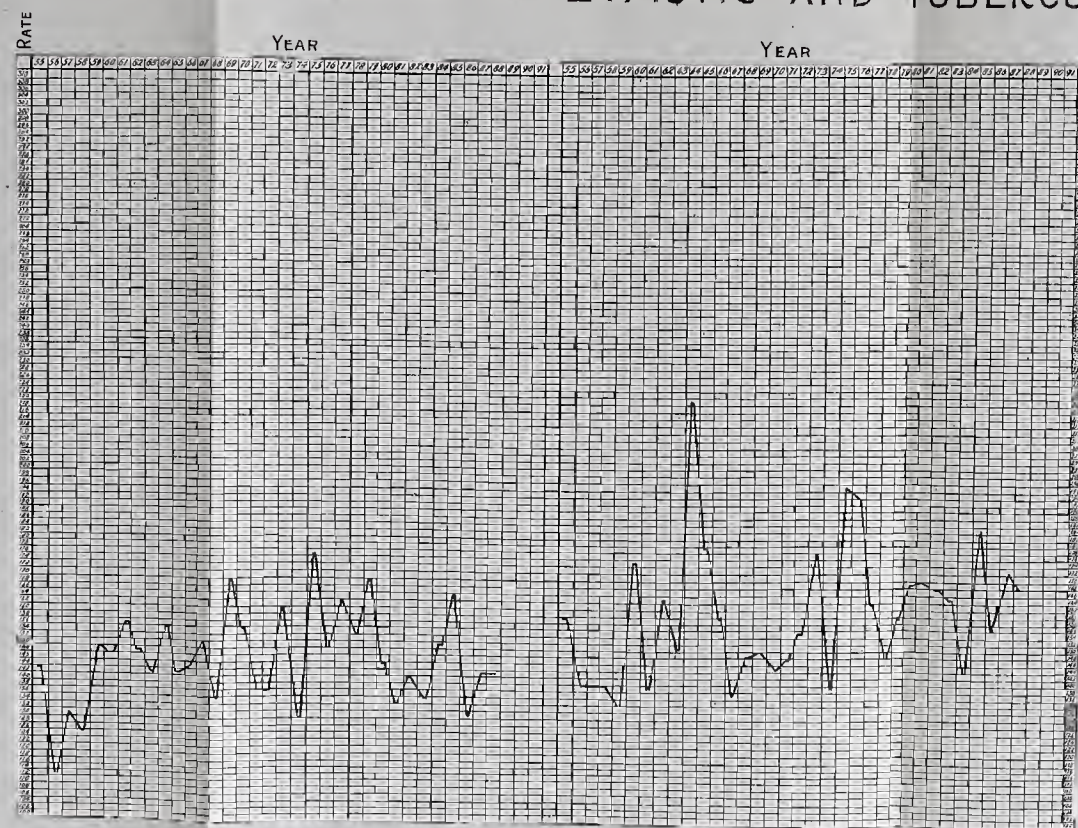
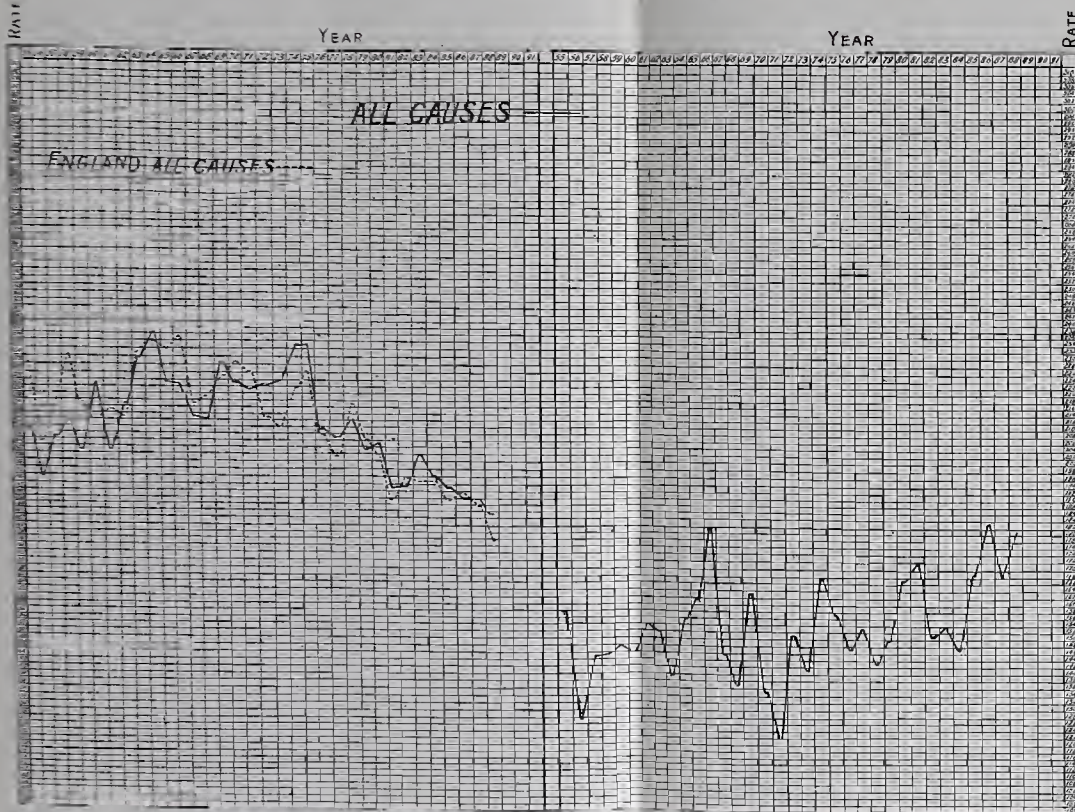
Subsoil drainage in a damp and low lying town or village site is in no way compulsory, and consumptive nurses may still, without let or hindrance, tend our young children, and spread around them unconsciously one of the many mantles of the destroying angel. The law is silent on those vital concerns. Who is to blame? Who, but the people themselves. They want teaching, they need warning, they require working up.

Gentlemen, this is your duty. Upon you, as the sanitarians of Scotland, aided by the public press, lies, first of all, the responsibility. When that responsibility is faithfully discharged, and the people of our country awake to a full knowledge of the "indirect and clandestine influences of filth" in its hydra-headed forms, we may rest assured our Government will, in the future as in the past, reach forth to us the helping hand.

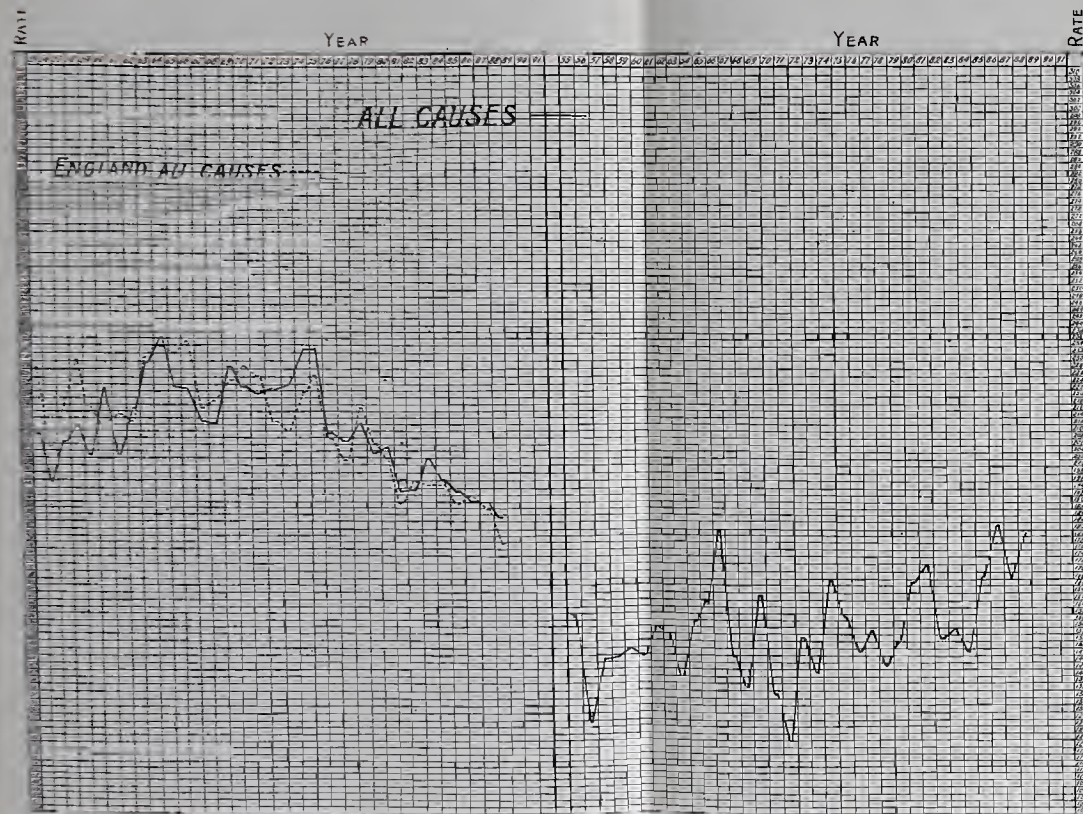
SERIES OF DIAGRAMS SHOWING THE DEATH RATES FROM ALL CAUSES PER 10000 OF THE POPULATION IN SCOTLAND AND EACH OF HER COUNTIES SINCE 1855, AND ALSO THE PER CENTAGE OF ZYMOTIC AND TUBERCULAR DEATHS TO TOTAL DEATHS.



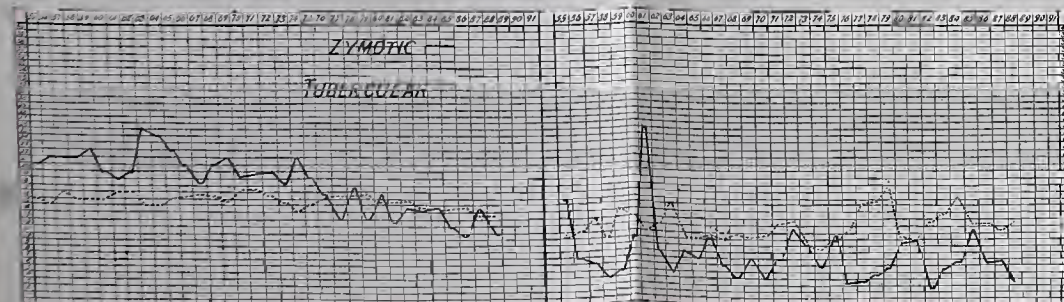
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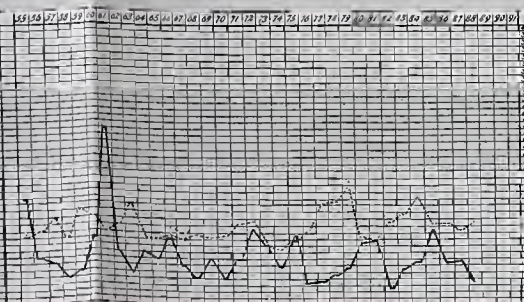
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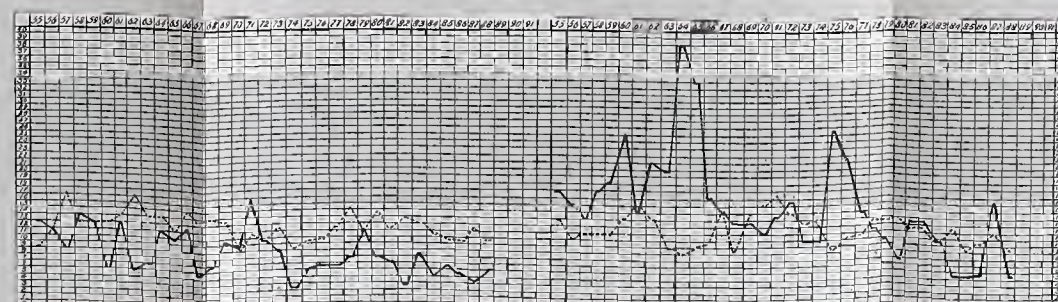
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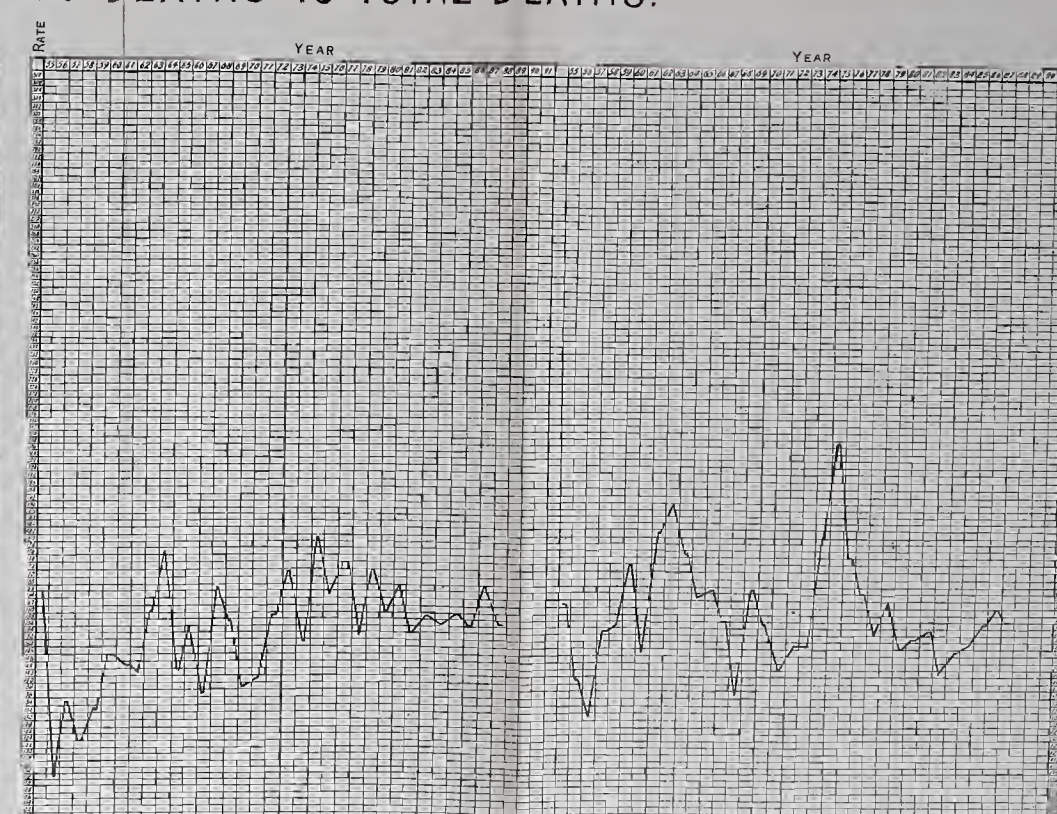
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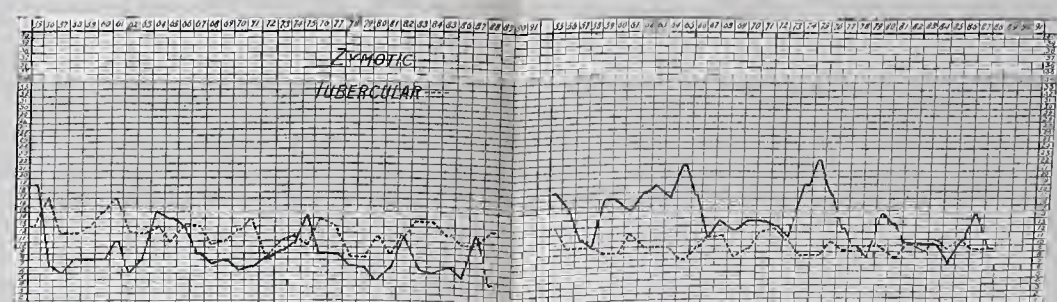
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CAITHNESS

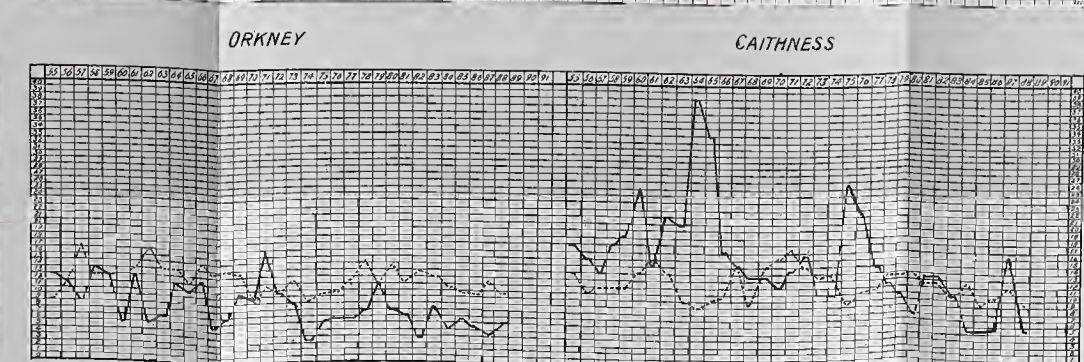
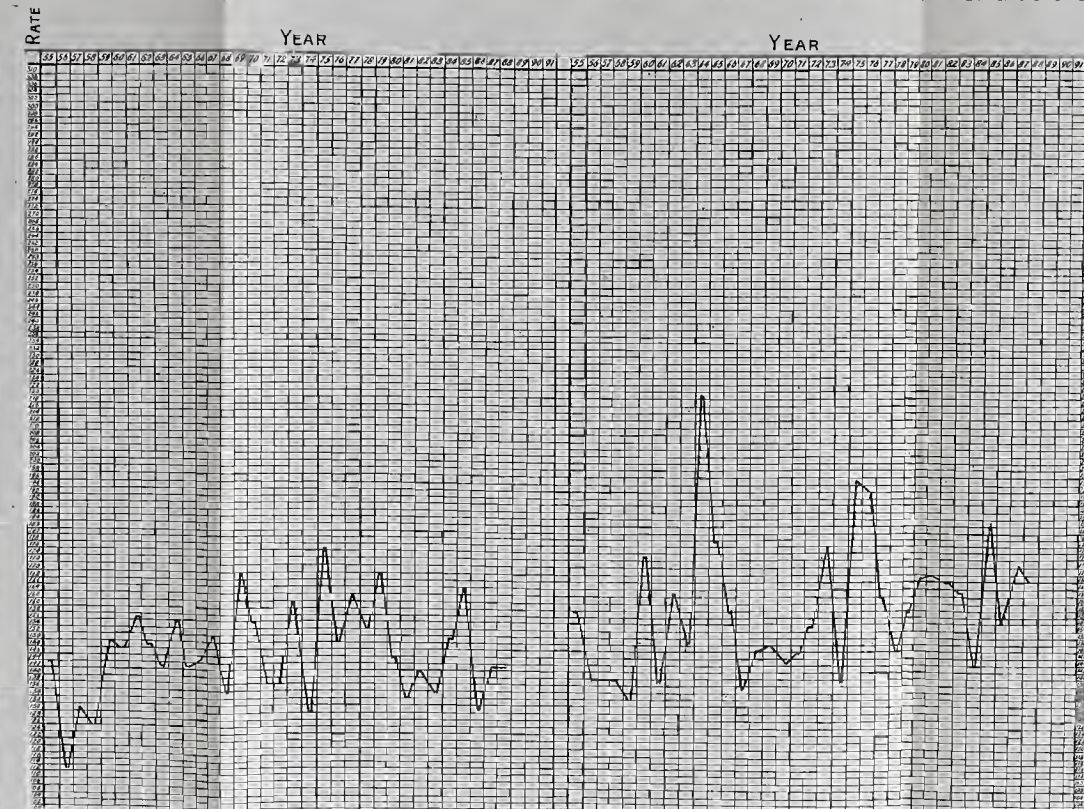
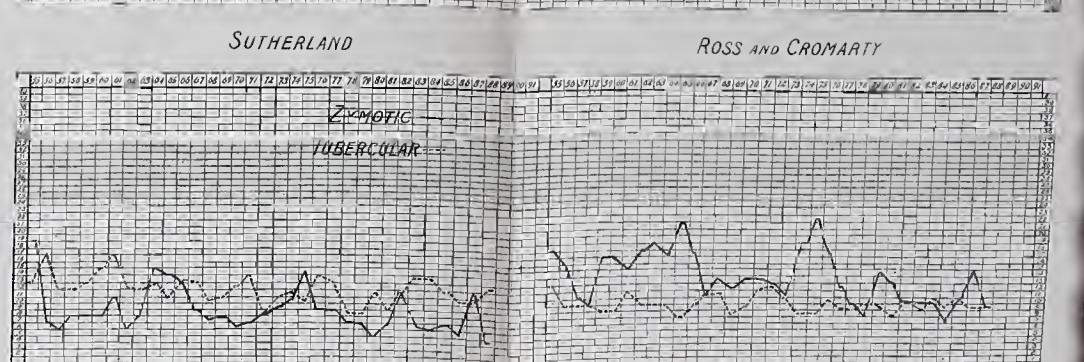
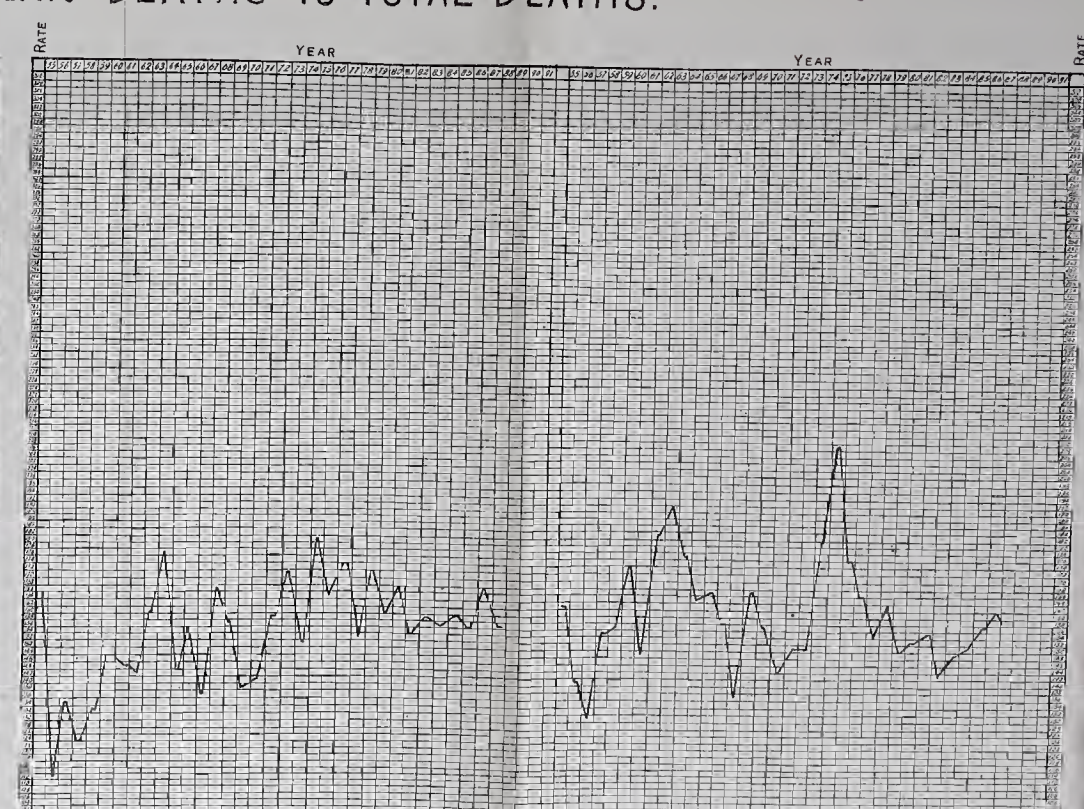
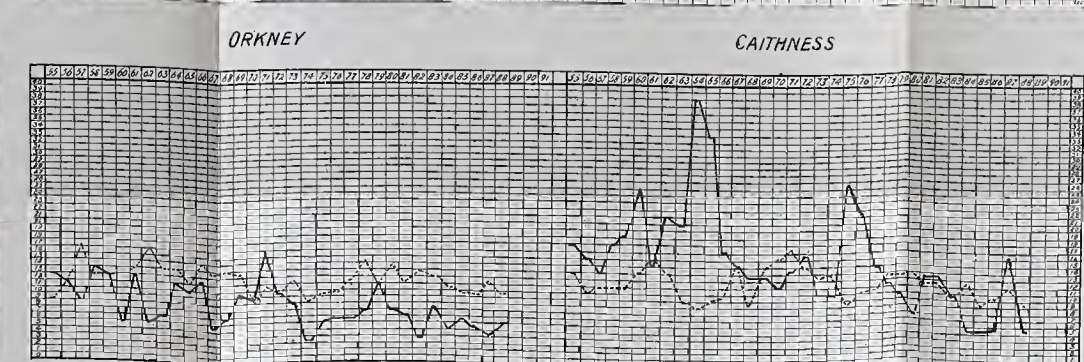
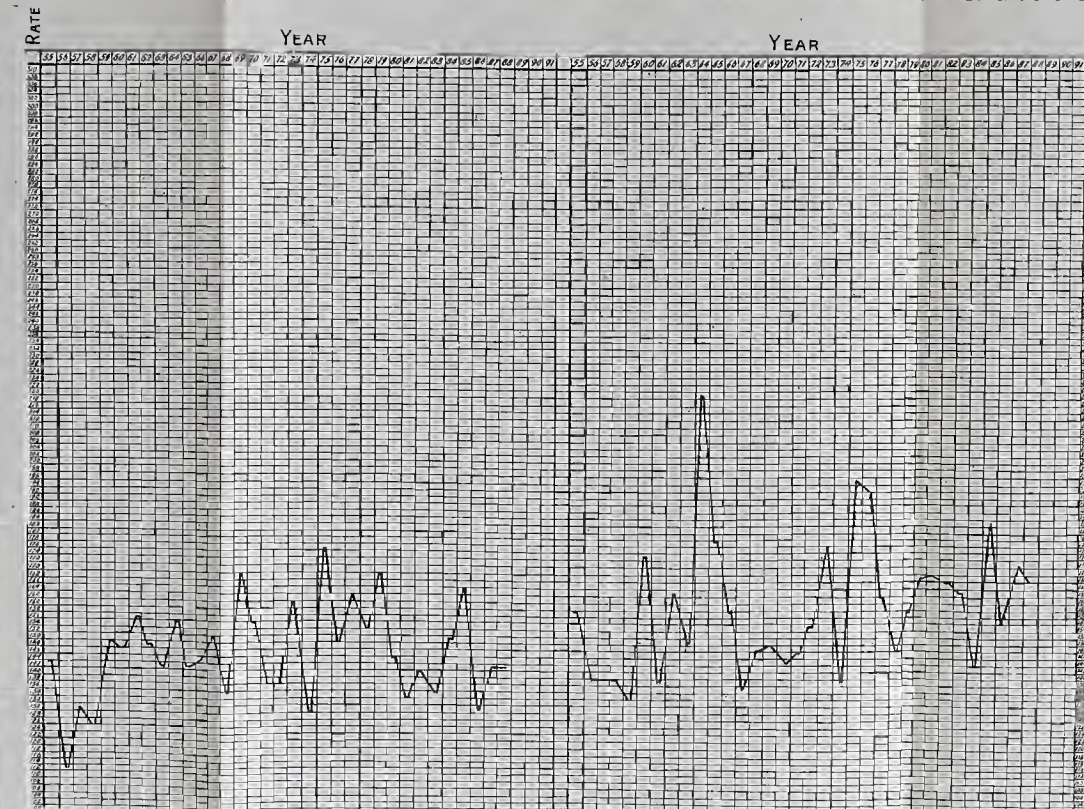
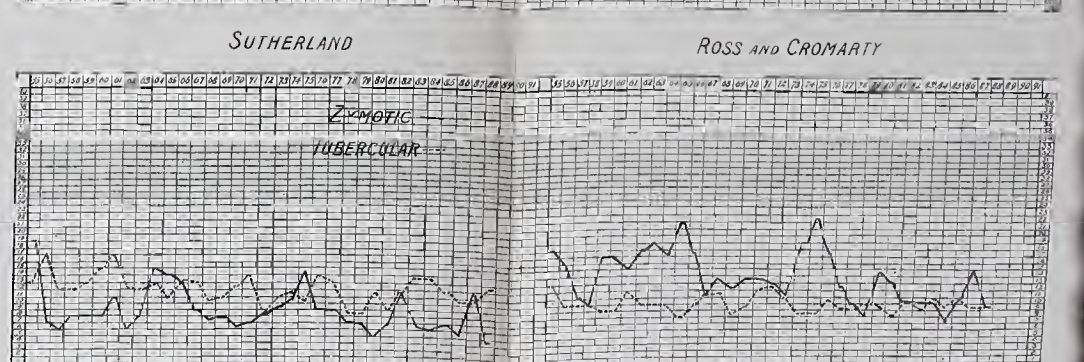
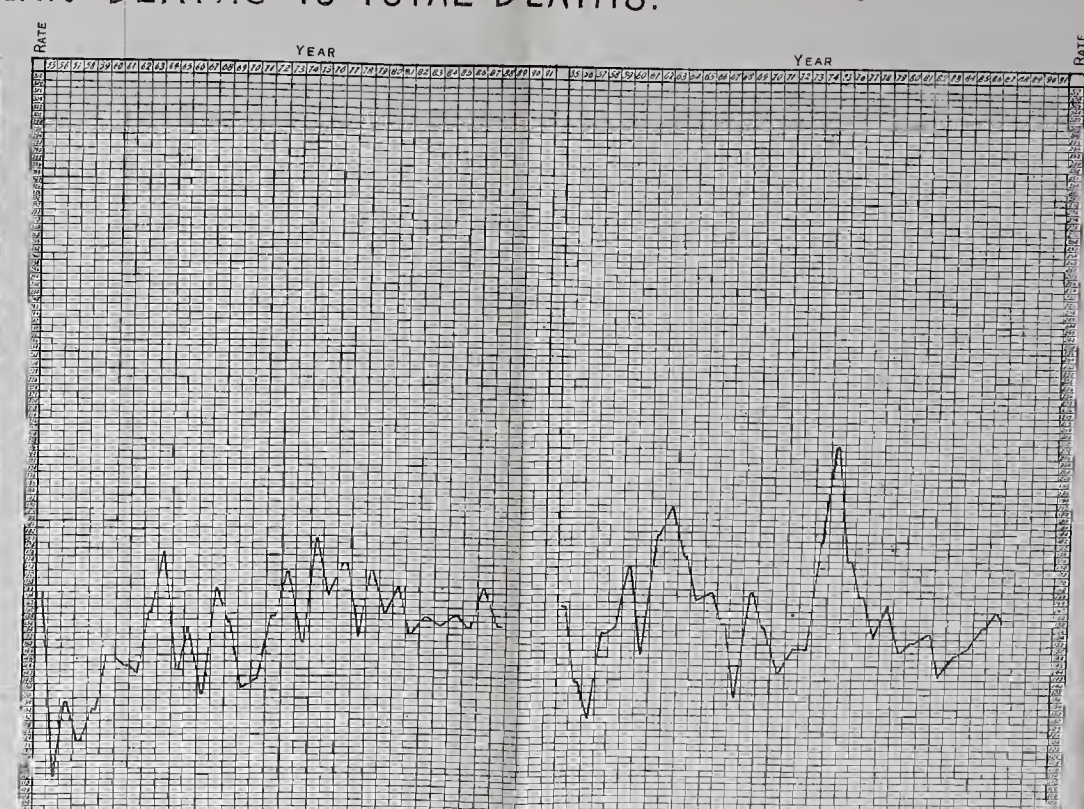
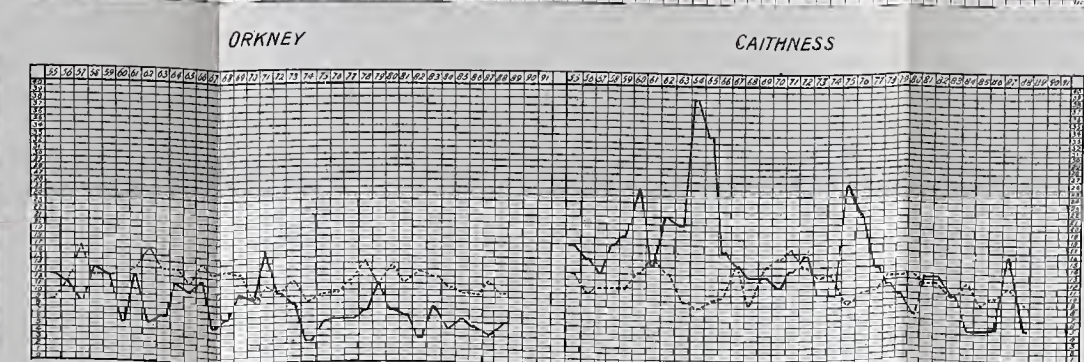
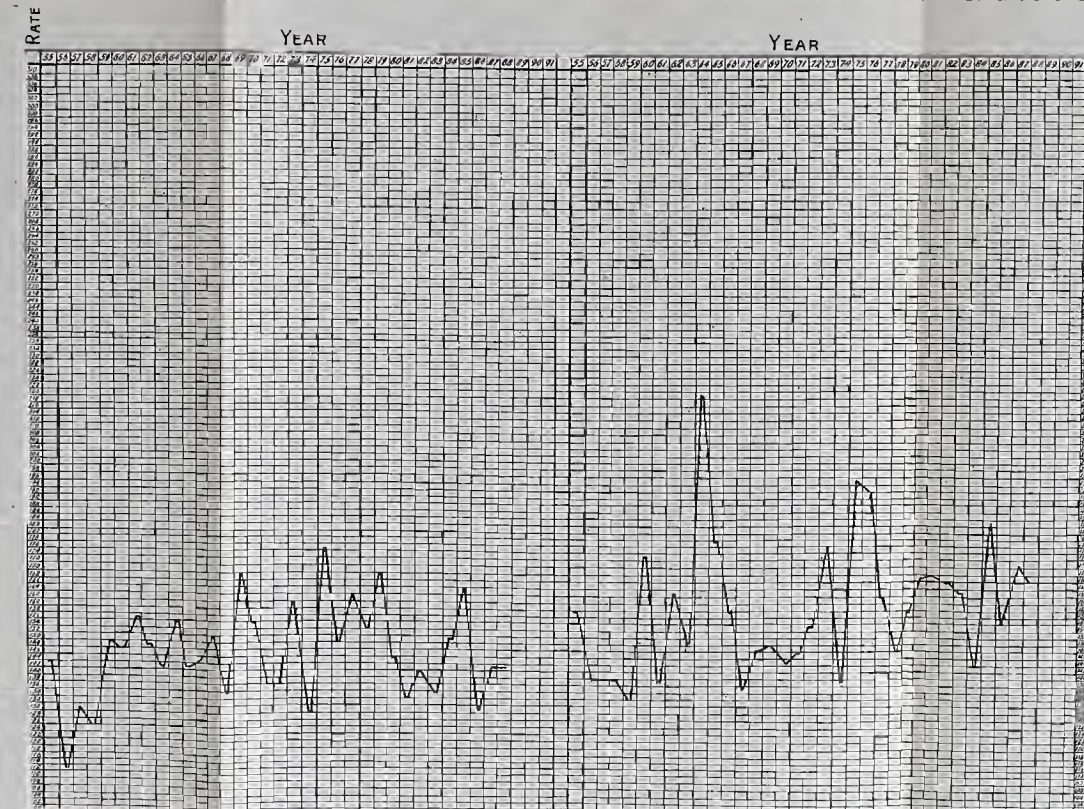
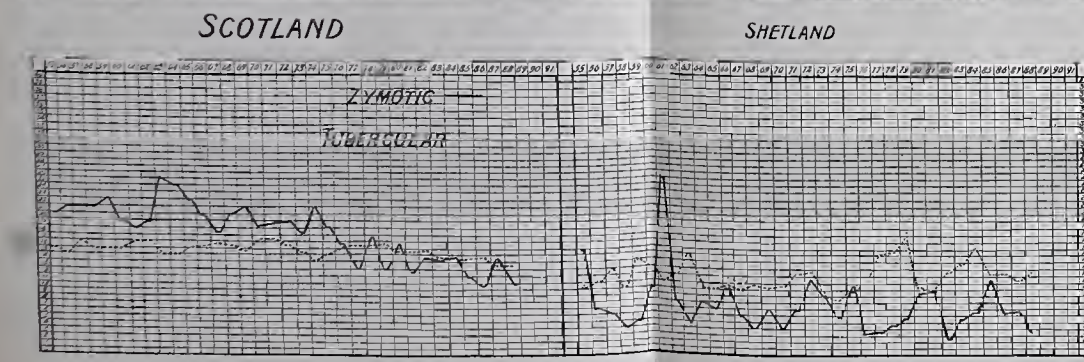
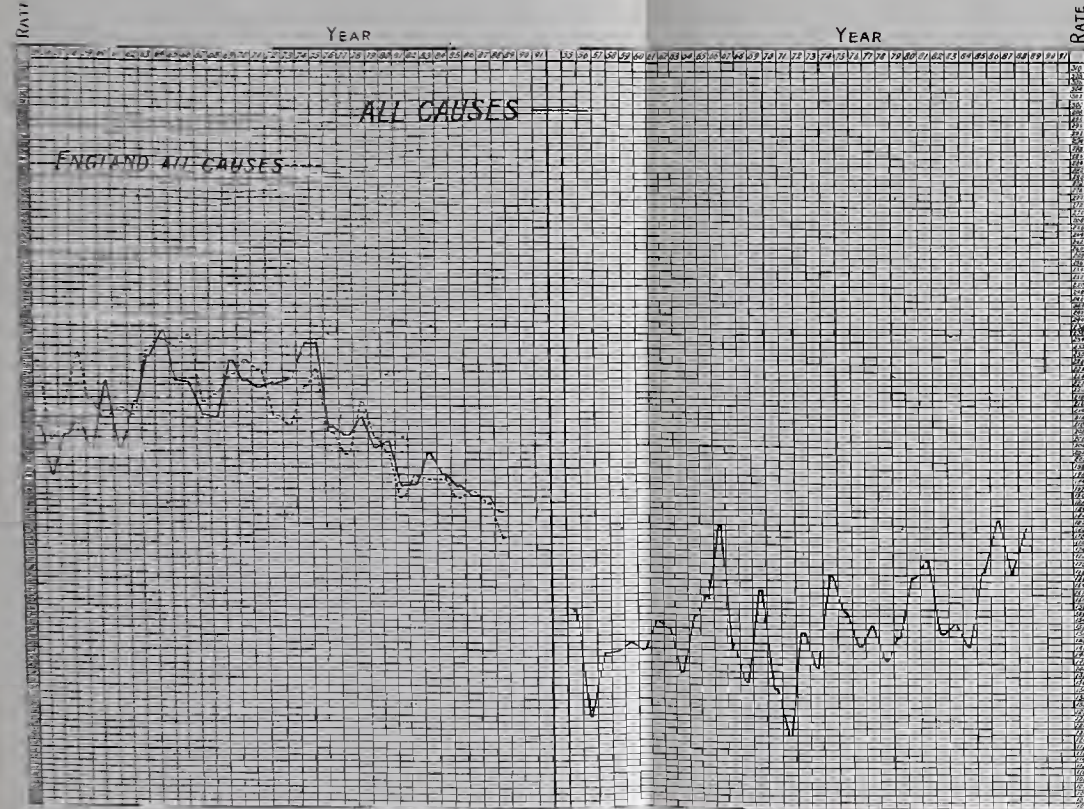


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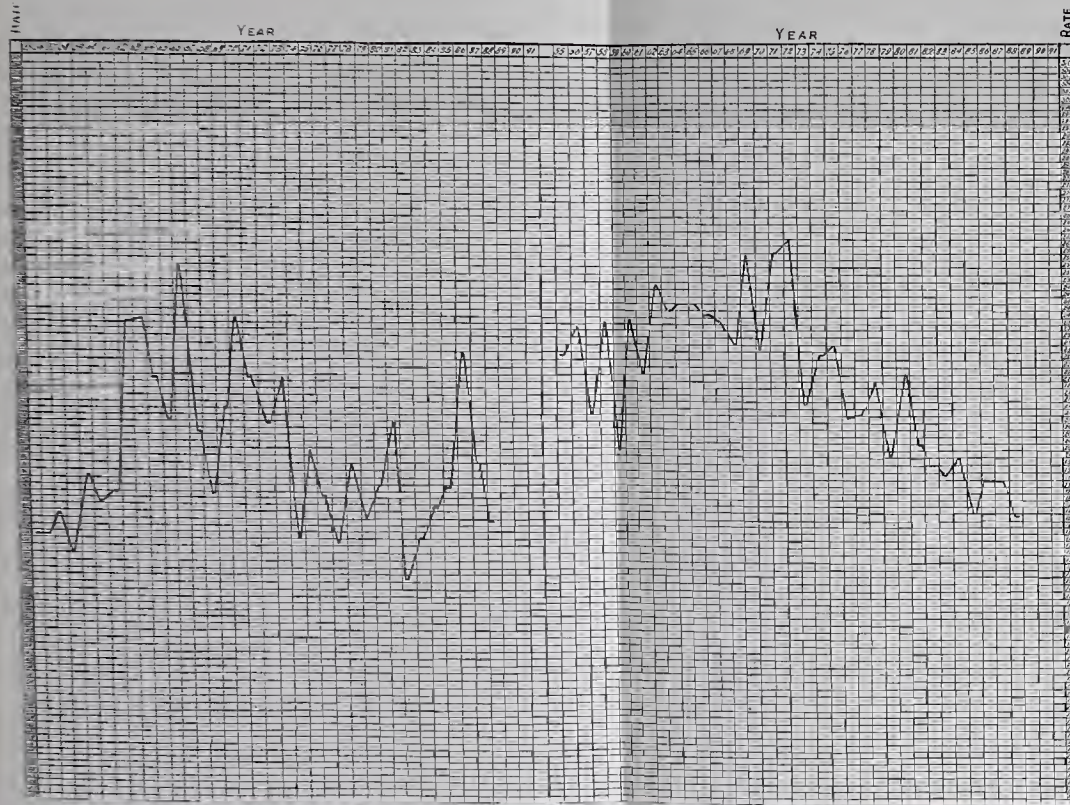


ROSS AND CROMARTY

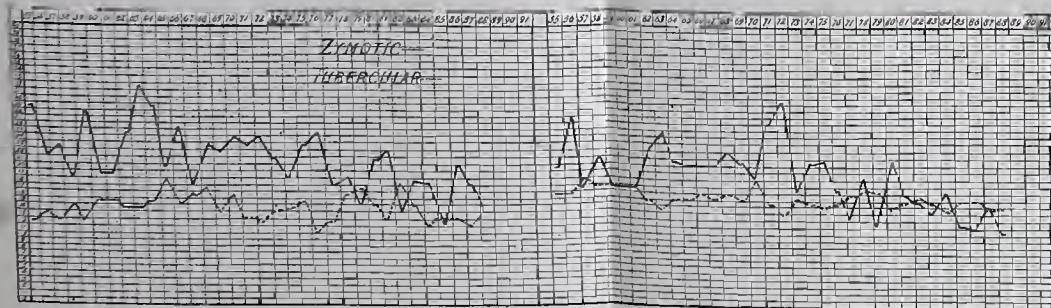
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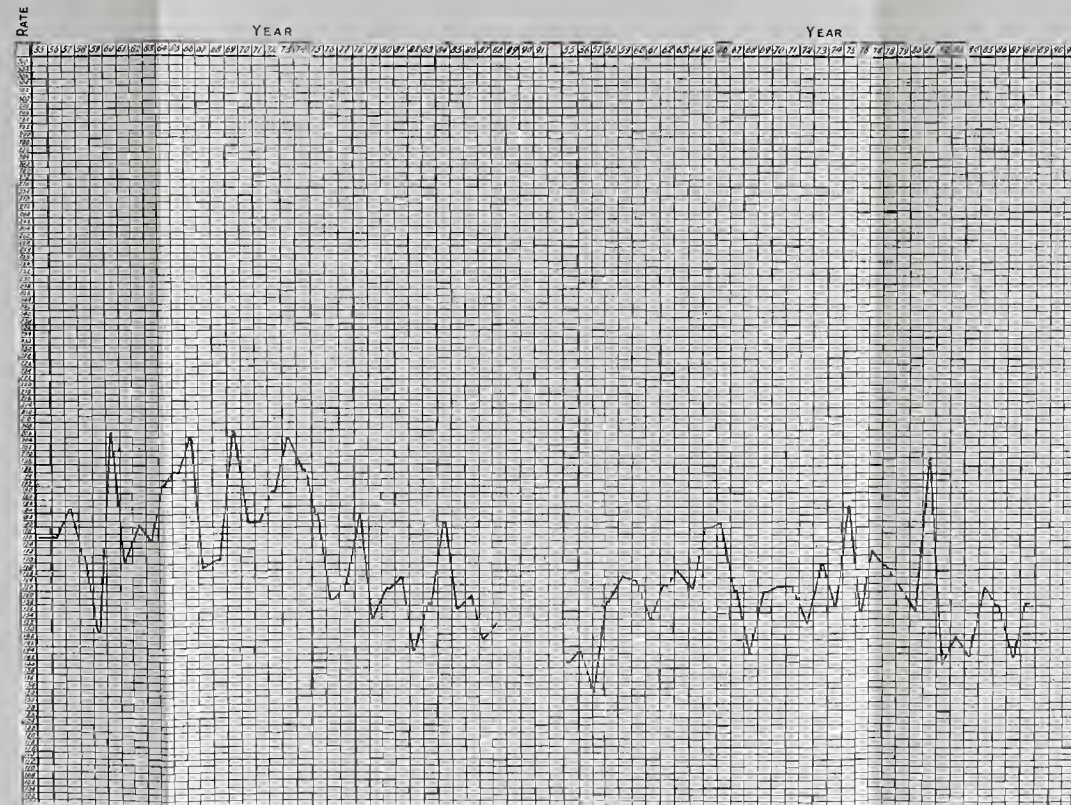
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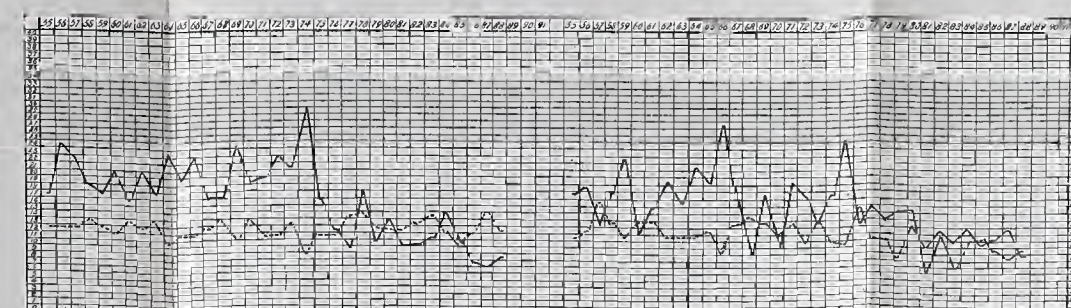
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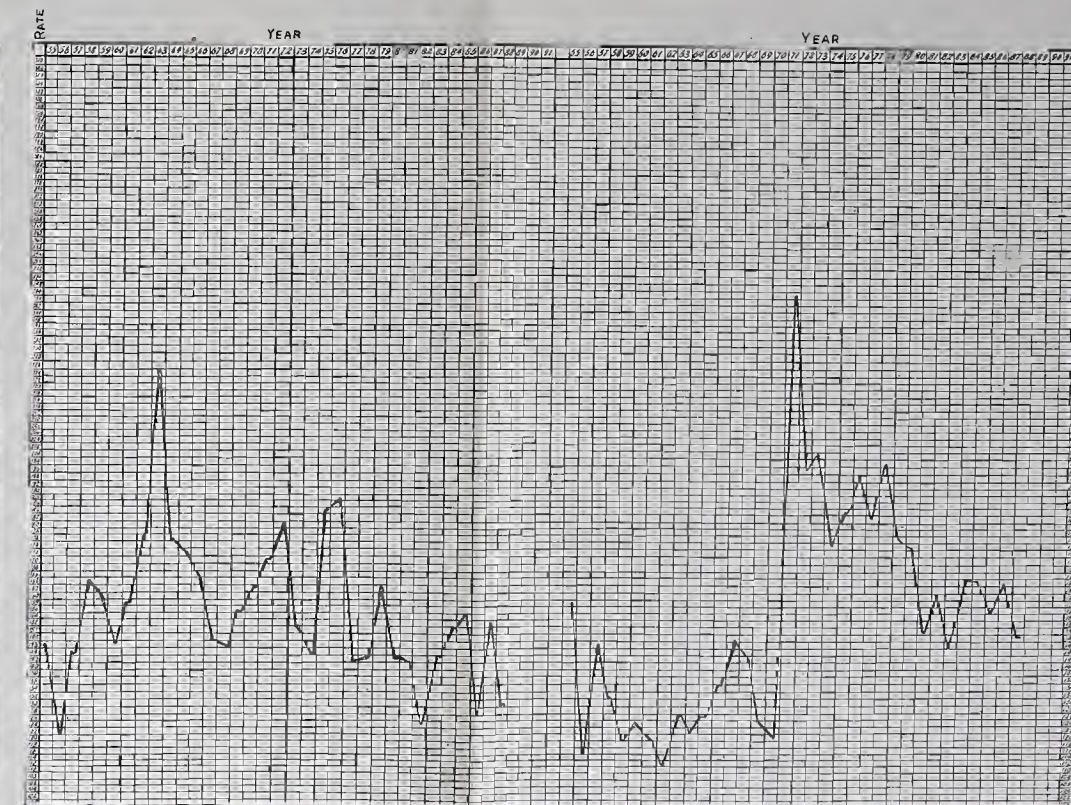
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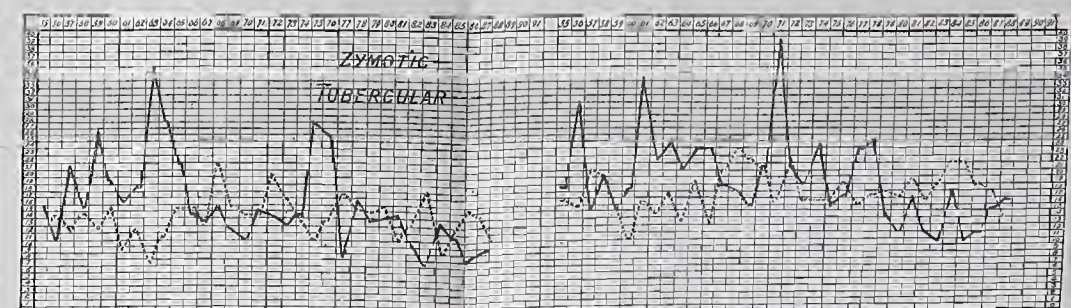
HADDINGTON



BERWICK



PEEBLES



SELKIRK

SERIES OF DIAGRAMS SHOWING THE DEATH RATES FROM ALL CAUSES PER 10000 OF THE POPULATION IN SCOTLAND AND EACH OF HER COUNTIES SINCE 1855. AND ALSO THE PER CENTAGE OF ZYMOTIC AND TUBERCULAR DEATHS TO TOTAL DEATHS.

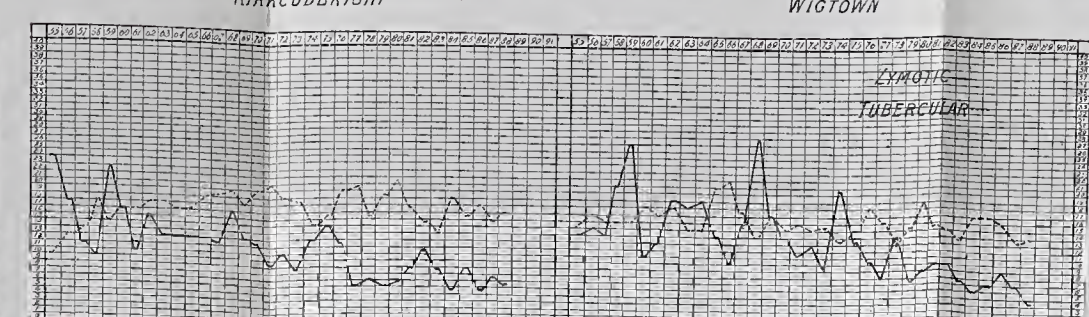
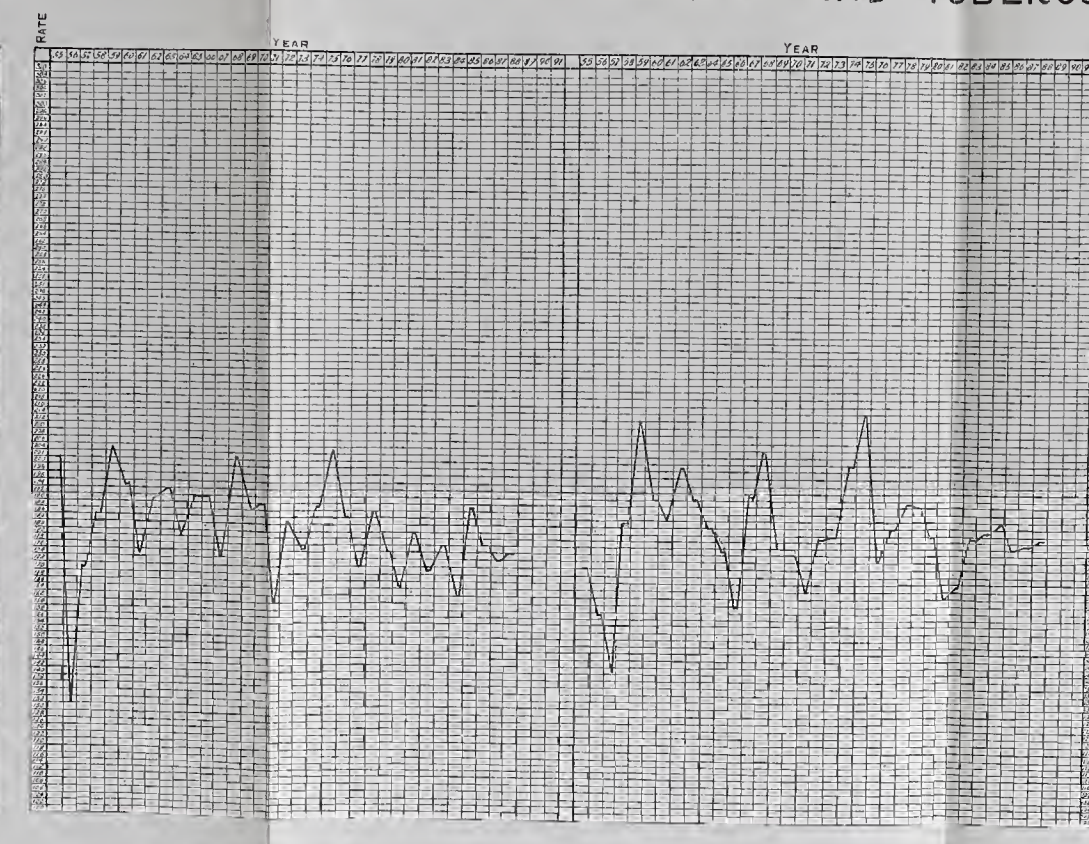
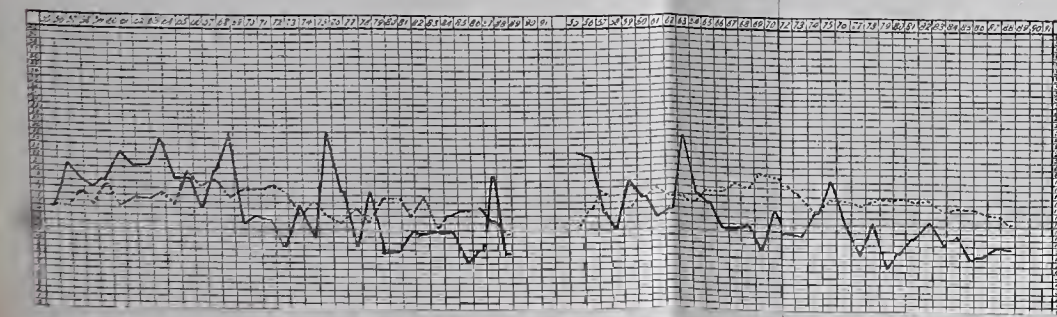
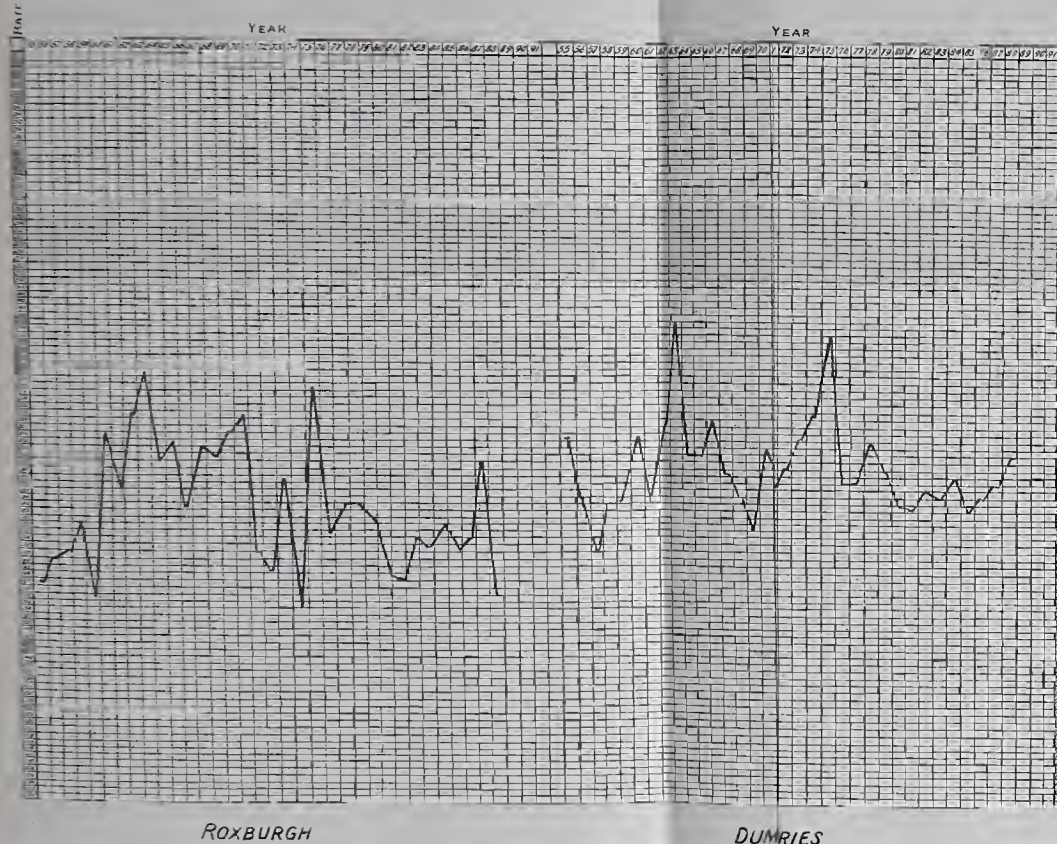


TABLE Showing the Average Mortality and Death Rates in the Counties for two Septennials 1855-61 & 1882-88.

	1855 TO 1861.			1882 TO 1888.		
	ALL CAUSES Rate Per 10000	ZYMOTIC Rate Per 10000	TUBERCULAR Rate Per 10000	ALL CAUSES Rate Per 10000	ZYMOTIC Rate Per 10000	TUBERCULAR Rate Per 10000
Scotland	207.28	21.28	16.14	192.85	13.16	14.48
Selkirk	131.14	21.57	16	81.59	13.13	18.36
Orkney	138.43	11.43	13	214.57	5.74	11.78
Shetland	146.28	10.57	11.71	1016.71	6.11	12.91
Caithness	147.14	18	13	12165.14	8.21	11
Peebles	149.28	17.43	12.57	1114.43	9.54	13.23
Berwick	151.71	16.28	12.71	4151	9.57	11.11
Ross & Cromarty	152.86	14.86	10.42	5153.57	10.51	9.88
Inverness	153.57	14.14	11.42	13166.42	9.54	9.47
Kincardine	155.42	19	13.14	3150.43	10.46	11.24
Sutherland	157.57	9.57	14.14	7158.71	7.5	12.11
Argyle	161	14.28	13.42	15168.86	7.67	12.54
Elgin	164	14.57	14.14	17170.42	9.57	12.94
Kinross	164.56	15.28	12.42	16170	6.31	10.2
Banff	168.85	17	12.26	9164.14	11.36	11.26
Clackmann	174.71	16.71	15.85	22176	13.78	15.84
Haddington	177.14	19	12.14	6158.28	9.4	12.06
Roxburgh	177.42	19.42	15.86	20174.57	10.84	13.71
Wigtown	177.71	16.4	16.42	23178.71	7.47	15.17
Elie	179.14	21	12.14	19173.71	10.84	12.76
Nairn	179.57	15.14	13.71	11165.14	8.1	9.51
Kirkcudbright	180.57	16.42	14.86	21175.71	7.8	16.51
Aberdeen	182	19.71	17	14166.86	12.44	12.37
Linlithgow	182.42	22.71	13.28	28189.43	16.17	13.3
Dumfries	190	16.71	15.14	28190.85	10.07	14.74
Perth	190.71	18.85	13.85	18173.5	8.46	12.23
Stirling	200	20.14	14.85	25179.86	13.33	14.11
Bute	201.86	14.71	20.14	31203.85	10.73	15.64
Dumbarton	205.71	21.71	19	21179.3	14.66	14.94
Ayr	211	23.28	19.28	21190.57	13.1	16.23
Forfar	226.71	24.71	14.71	30193.43	12.01	14.64
Edinburgh	228.28	19.42	16.86	29192.57	13.31	14.63
Renfrew	260.86	24.86	18.57	32217.43	16.4	15.47
Lanark	265.86	23.86	17.57	33224.14	16.84	16.01

